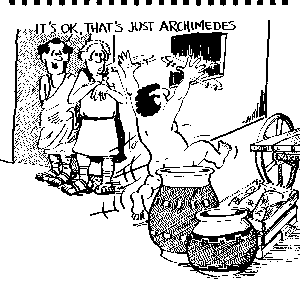
**A comparison of Mass and Volume** Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Physical Science Mr. Rita** Period \_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_

**Overview:**



In the past two weeks we have learned how

Measure with different types of instruments,

how to measure area and volume, and how

to determine the mass of an object. You also

learned how important it is to measure with

precision in an experiment. Now it is

time to put that information to work to solve

a problem. You and your partner will be

given several objects to record a mass

and volume for each object.

Before you begin, log on to the internet and

read the story of a man named Archimedes,

& how he solved the mystery of the gold crown.

Go to <http://library.thinkquest.org/4116///History/stories.htm> and read the story of *The Gold Crown*.

After reading the story, discuss with you partner how mass and volume were used by Archimedes in finding out if pure gold was used to make the crown. Write down a few notes about the story and your discussion.

**Leave your computer at your desk, and proceed to a lab station.**

**Lab Procedure:**

At the back lab counter you will find the following objects:

* Several pieces of glass tubing (BE CAREFUL – Very fragile)
* Several pieces of brass metal
* Several pieces of aluminum metal
* Several lumps of clay(divide into 3 lumps)

At the lab stations, you will find 2 graduated cylinders, beaker, pipette, and a balance.

Using a piece of graph paper, create a data table for each of the given materials.

For 3 samples of each object, record a mass and volume. An example is below.

|  |  |  |  |
| --- | --- | --- | --- |
| Material | Object Description | Mass (g) | Volume (ml) |
| Glass | Bent tube |  |  |
| Glass | Long tube |  |  |
| Glass | Small tube |  |  |
| Aluminum |  |  |  |
| Aluminum |  |  |  |
| Aluminum |  |  |  |
| Clay |  |  |  |
| Clay |  |  |  |
| Clay |  |  |  |
| Brass |  |  |  |
| Brass |  |  |  |
| Brass |  |  |  |

Measure and record the mass and volume for each object. Strive for precision!

**Once all measurements are made, clean up your lab station. Empty all glassware, return the samples, and wipe down your station. Return to you seat with your computer.**

Using Excel spread sheets, create a point plot graph using the retrieved data, for each type of material. The x-axis should have the volume, and the mass on the y-axis. You should have 4 graphs.

(Check with Mr. Rita when done)

**The rest of the story:**

Archimedes found out that the crown displaced less water than the equal amount of gold. He concluded that the crown was made partially of silver (a cheaper metal). This was bad news for the goldsmith who had apparently cheated the king out of gold.

**Post Lab Questions:**

Answer the following post lab questions:

1. What is the definition of Density?
2. If you were to connect the lines on each of your graphs, there would be a visible pattern. Describe that pattern. *(What would be the volume of an object of 0 mass?)*
3. Make a qualitative statement for this relationship. *(What relationship is there?)*

**Discussion:**

Log on to Mr. Rita’s Wiki (2ndfave.wikispaces.com) and click on **your class’** lab page. Follow the instructions found there.